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ABSTRACT

The effects of instructional guides and a wait time feedback device (called a "Wait Timer") on the classroom interaction of middle school science teachers are examined. The Wait Timer, an unobtrusive indicator of wait time, is an automatic device that activates a light when a person speaks. The duration of the light at the end of a question, response, or other pause can be regulated to control wait time length. The effects of using the Wait Time was noted to be enhanced by a supportive intervention process that employed analyses of tape recordings of classroom discussions. Through studies, it has been determined that effective use of wait time can result in spontaneous improvements in both cognitive and affective variables in the classroom. These changes are greater if wait time information is supplemented by supportive intervention from persons who have studied tape recordings of interactions from the teachers' classrooms. It appears that monitoring wait times using an electronic device accompanied by skilled analyses of tape recordings and supportive intervention do provide an avenue for the improvement of teaching skills. (ML)

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A SYMPOSIUM ON WAIT TIME

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TWO EFFECTIVE WAYS TO IMPLEMENT WAIT TIME

by

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Two Effective Ways to Implement Wait Time

Swift and Gooding (1983) investigated the effects of instructional guides and wait time feedback on the classroom interaction of 40 middle school science teachers. Whereas a comparison group made essentially no changes in their teaching behavior during the semester, teachers that used a wait time feedback device (Wait Timer [TM]) extended their pause durations significantly. The Wait Timer is an automatic device that activates a light when a person speaks. The duration of the light at the end of a question, response, or other pause can be regulated to control wait time length. When 3 s have elapsed the light is extinguished to signal that it is appropriate for another participant to enter the discussion.

The increase in wait times was accompanied by a number of desirable changes that occurred spontaneously. These changes included:

1. more frequent use of evaluative questions,
2. more frequent contributions of volunteered information relevant to discussions,
3. longer answers to questions,
4. a lower percentage of teacher talk, and
5. more student words relevant to the discussion.

The study was conducted in such a manner as to minimize contact between the research team and the participating teachers. For example, tape recordings of class discussions were collected each week by a staff member not involved in data analysis. This

and other steps were taken to insure that any observed changes were due only to the variables of immediate feedback and guides, and not to interaction with the investigators. These conditions, necessary for the experimental study, were deemed by the investigators to be an artificial situation. For example, one group of participants in the study used the feedback devices with no rationale, except that the investigators thought that wait time was a factor of interest.

Analysis of the tape recordings later revealed a number of surprises to the research team. These included a lack of effective discussions, as indicated by long lectures and oral drill exercises, and a lack of observance of wait time 2 (teacher wait time) by the teacher-participants. To remedy these concerns an inservice teacher education program was designed. The new program entailed a workshop, weekly tape recordings of the participants' classes, analysis of the recordings, and sessions with the teachers concerning their effectiveness.

Procedure

From the 40 teachers in the original study, 12 teachers were contacted and asked to participate in a follow-up study. Eleven agreed; the first 10 were accepted. Of these, three were in the comparison group of the original study, one had used the instructional guides, and six had used the wait time feedback devices.

In the first phase, the teachers participated in a two-and one-half hour workshop in which data from the initial project was presented and transcripts containing short and long wait times

were reenacted and contrasted. The teachers discussed the similarities and differences in the transcripts and concluded that longer wait times produced higher cognitive levels of discourse. They also noted that students gave longer relevant answers and had increased opportunities to engage in dialogue with teachers and classmates. Furthermore, evidence was provided to the teachers showing that increasing their wait times following questions and answers produced no difference with respect to discipline in the classroom, a point about which they had expressed concern. Several specific strategies for engendering true discussions were presented. Finally, each teacher was provided with an electronic device which would supply an immediate indication of successful pausing to a 3 s criterion following questions and answers.

The next phase of the project made use of the supportive intervention process. This was defined as a procedure in which improved discussion strategies were noted during evaluations of tape recorded lessons. In this procedure the study team listened to recordings in a classroom interaction laboratory rather than conducting analyses in the presence of the teachers. Notes were taken which emphasized teaching successes and suggested avenues for further professional growth. Behavior that was negative or contradictory was ignored in the comments prepared for sharing with the teachers. The term "criticism", with its negative implications of failure, was carefully avoided. Reinforcement was given for successful approximations of 3 s wait times, operation at higher cognitive levels of thinking, and utilization of student

interaction.

The duration of the study was limited to four weeks, whereas the previous project had extended throughout a full academic semester. Consultation with individuals during planning time on each Monday provided opportunities for supportive intervention and discussion of teaching successes. This procedure, summarized in Figure 1, could be extended and repeated as often as deemed necessary by the participants. Three supportive sessions were provided in this study.

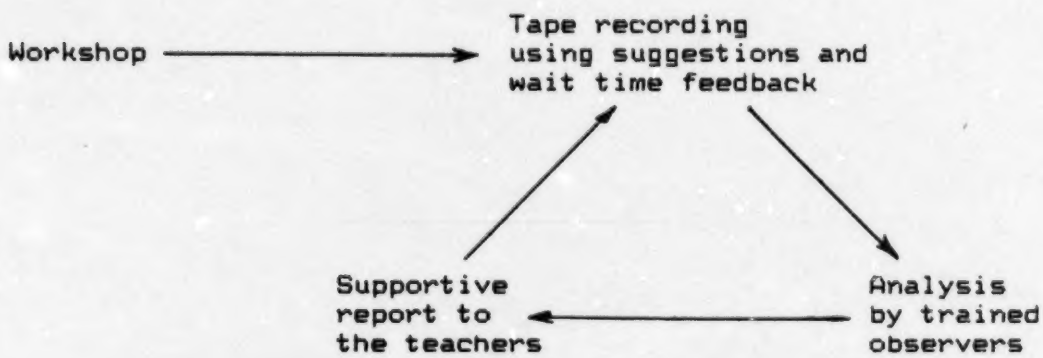
Workshop
Tape recording using suggestions and wait time feedback
Analysis by trained observers
Supportive report to the teachers

Figure 1. The supportive intervention process. The participants can become the trained observers in this model.

Results

The effectiveness of the wait time feedback devices in increasing pauses during classroom discussions was demonstrated in a semester-long investigation (Swift & Gooding, 1983). These changes are illustrated in Figure 2 for the 6 teachers who were in the experimental groups in both studies. Baseline data are included for comparison purposes. The results obtained by using

supportive intervention and wait time feedback together, also found in Figure 2, were presented earlier in some detail (Swift, Swift, & Gooding, 1984). As indicated by the middle bar, the presence of the Wait Timers helped both teachers and students increase the duration of their pauses. Spontaneous changes in other parameters accompanied these longer wait times. The lower bars in Figure 2 represent the changes that were obtained when teachers received wait time feedback and were encouraged by supportive intervention. All results were significant beyond the .01 level. Some comments on each of the variables follow.

Wait time 1 and 2. Students were quick to take advantage of the thinking time that was permitted. Teachers, habituated and pressured to hurry, were less able to be patient. However, with the help of Wait Timers and supportive intervention, their pauses averaged 2.45 seconds, a value that appears to be adequate to stimulate beneficial effects.

Percent of talk by students. The teachers still were dominant during discussions but, by drawing attention to higher level and/or divergent questions, the percentage of time that students were talking about topics relevant to the lessons nearly doubled over the baseline data.

Percent of higher level questions. Asking questions at higher cognitive levels is one of the most important consequences of using longer wait times. From the baseline of only 8% the proportion increased to 19% with wait time feedback. After the workshop that examined the importance of adequate wait times and the techniques of supportive intervention, this proportion increased to 23%. Following supportive intervention sessions,

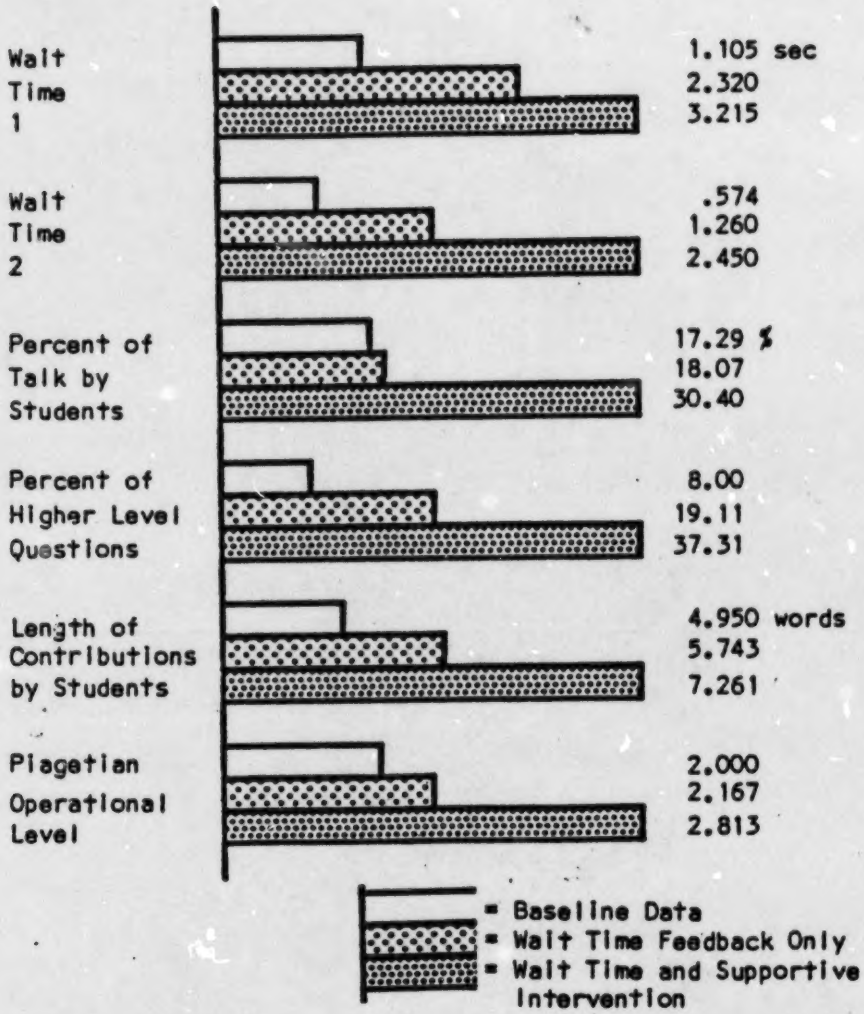

Figure 2. Changes in several of the measured variables.

about 42% of the questions were classified as above the recall, identification, association, or reformulation levels. These changes were brought about without instruction in questioning skills.

Length of contributions by students. Word counts, which excluded stammering and pause fillers such as "uh", revealed that the short replies of middle school students became longer, another indication of higher cognitive level processing.

Piagetian operational level. Doerr (1984) classified the Piagetian level of each discussion using four categories: early concrete (1), fully concrete (2), late concrete-transitional (3), and fully formal (4). Although no mention was made of Piaget during the workshop and supportive intervention phase of our study, teachers moved toward the formal stage of development.

All of the teachers in the sample expressed a high degree of satisfaction with the manner in which supportive intervention was provided. The teachers improved their skills while maintaining positive self-images. Throughout the intervention period, they exhibited enthusiasm toward professional growth and, at the conclusion, stated that they would miss having the valuable input which had been provided by the analysis team. They expressed interest in continuing the techniques on their own.

In sum, the authors have determined that effective use of wait time can result in spontaneous improvements in both cognitive and affective variables in the classroom. These changes are enhanced if wait time information is supplemented by supportive intervention from persons who have studied tape

recordings of interaction from the teachers' classrooms. In an era of low teacher turnover and an aging teacher population, methods that effectively improve the skills of inservice teachers are of vital importance. These could also prove to be important tools in the training of preservice teachers. Thus, it appears that monitoring wait times using an electronic device accompanied by skilled analyses of tape recordings and supportive intervention do indeed provide an avenue to the improvement of teaching skills. Further studies with wait time and/or supportive intervention are planned for 1985-1986.

It is believed that teachers can use supportive intervention to ameliorate the problem of teacher isolation. The importance of professional dialogue is clear. Rosenholtz and Kyle (1984) state that without it, "...teachers have no avenues for using their limited time together to share ideas, discuss teaching problems and possible solutions, and in turn, develop better teaching skills. Without professional dialogue, teachers' skill acquisition and development is ironically banished to an off-campus location" (p.12). Because of this problem Rosenholtz and Kyle believe that teacher professional development is not maximumly utilized and the ultimate price is paid in reduced student learning. We agree with their conclusion and look forward to the anticipated outcomes resulting from supportive intervention and wait time feedback.

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